

Claims

1. A method of fastening an outer aircraft skin to an inner substructure, the skin or both being made of a non-metallic fibre and resin composite material, using a fastener bolt, the method including the steps of:
5 inserting the bolt through the outer skin and the substructure and securing the bolt adjacent an inner surface of the substructure such that a bolt head abuts the outer aircraft skin; applying a layer of electrically insulating material over the bolt head and the outer aircraft skin, and
10 incorporating an electrically-conductive layer in the outer surface of the insulating layer, the conductive layer being configured so as to overlie and having edges extending laterally of the bolt head and being separated therefrom by insulating material, the layer of insulating material adjacent the lateral edges of the conductive layer being adapted
15 to break down dielectrically before dielectric breakdown can occur in the insulating material separating the conductive layer and the bolt head, thereby to divert electrical current from a lightning strike away from the fastener and prevent arcing at the fastener.
2. A method as claimed in Claim 1 comprising forming voids, inclusions or
20 pinholes in the layer of insulating material in the regions adjacent the edges of the conductive material to promote dielectric breakdown thereat.
3. A method as claimed in Claim 1 or 2 comprising including localised
25 doping in the layer of insulating material in the regions adjacent the edges of the conductive material to promote dielectric breakdown thereat.
4. A method as claimed in any of Claims 1, 2 or 3 comprising providing two
30 further layers of electrically-conductive material contiguous with the insulating material and the outer aircraft skin and in the regions adjacent the edges of the conductive material to promote dielectric breakdown so that electrical current flows through the insulating material from the

edges of the conductive material to the further layers of conductive material.

5. A method as claimed in any preceding claim comprising applying the layer of insulating material in the form of an appliqué layer.
- 5 6. A combination of an outer aircraft skin and an inner substructure, the skin or both being made of a non-metallic fibre and resin material, and a fastener bolt securing the two together and having a bolt head abutting the outer aircraft skin, wherein a layer of electrically-insulating material covers the outer aircraft skin and the bolt head and incorporates a layer
10 of electrically-conductive material configured so as to overlie and have edges extending laterally of the bolt head and being separated therefrom by insulating material, the layers of insulating material adjacent the lateral edges of the conductive layer being adapted to breakdown dielectrically before dielectric break down can occur in the insulating material separating the conductive layer and the bolt head, thereby to
15 divert electrical current from a lightning strike away from the fastener and prevent arcing at the fastener.
7. A combination as claimed in Claim 6 wherein the conductive layer is of solid or substantially solid metallic material.
- 20 8. A combination as claimed in claim 6 or 7 wherein the conductive layer comprises a strip which is applied relative to the outer aircraft skin so as to extend over and overlie a row of bolt heads forming a line of fastenings along the outer surface skin.
9. A combination as claimed in any of claims 6, 7, or 8 comprising providing
25 two further layers of electrically-conductive material contiguous with the insulating material and the outer aircraft skin and in the regions adjacent the edges of the conductive material to promote dielectric breakdown so that electrical current flows through the insulating material from the edges of the conductive material to the further layers of conductive
30 material.

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10. A combination as claimed in any of claims 6 to 9 wherein the layer of insulating material comprises an appliqué layer, the conductive layer being incorporated in the appliqué layer.